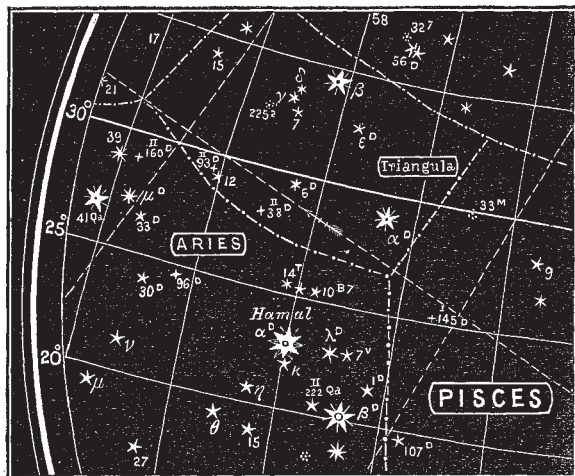


marking double, triple, and multiple stars, binaries (known or suspected), variables, Messier's nebulae, Sir W. Herschel's classification of his nebulae, and so on.

All stars in the B.A. Catalogue down to the sixth magnitude inclusive are to be introduced, besides all the objects in the Bedford Catalogue, Messier's nebulae, about 100 variables, red stars, and other objects of interest (in all about 1,500 objects). The scale of the maps is to be that of a 20-inch globe, and each map will be rather more than thirteen inches in diameter.

Mr. Proctor's series of gnomonic maps, in which the sphere is divided into the same set of pentagons, which



are arranged into two sets of six (namely, five northern equatorial maps around the north polar map, and five southern pentagons similarly arranged around the south polar map) will be added as index maps. As in these maps the constellation figures (coloured) are introduced, all necessity of adding these figures to the large maps is avoided, and so the clearness of the maps is much increased.

A letter-press introduction, with a list of star-names, will add to the completeness of the maps. Mr. Brothers, of Manchester, will photo-lithograph the maps if it should appear from the receipt (by him) of a sufficient number of names as subscribers, that the scheme is approved of by astronomers. He will supply to subscribers a specimen of Map 2, which alone is yet completed.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his Correspondents.]

Personal Equation of Astronomical Observers

CAN any of your readers inform me whether an attempt has hitherto been made to determine the absolute Personal Equation of Astronomical Observers? The most important of all astronomical observations consists in noting the time of passage of a star across the wires of a transit instrument; but it is found that no two observers exactly agree in the time assigned to the passage. From peculiar habit or bodily constitution some observers almost invariably register the passage of a star a fraction of a second before other observers. From the Introduction to the volumes of Greenwich Observations, we learn that it is the practice at the national Observatory to compare the observations of the junior observers with those of the principal observer, and to assume that the latter is correct. All the observations are thus brought into consistency with each other; but it is not known, I believe, whether all the time observations may not be a fraction of a second too soon or too late.

Cannot this question be determined experimentally in a very simple manner? Imagine an artificial star, formed by a minute

electric spark, placed at a considerable distance, say three miles, and made to move across the field of a transit instrument at a rate not very different from the average apparent rate of stars observed (say nine inches per second): very simple mechanism might be devised to register upon the chronograph of the observatory the exact moment at which the star is absolutely upon each of the cross wires of the telescope. At the same time the observer, whose error is to be determined, should endeavour to record in the ordinary way the passage of the star, and the difference of time, as shown on the chronograph, would give the required error. Every observer might thus be put through a kind of exercise, which would inevitably show the degree of his proficiency, or detect any change in his habits of observation.

I need hardly say, that however small may be the remaining personal error unallowed for in the Greenwich observations, the time may come when the determination of some most important astronomical question may depend upon that quantity. And though those observations may at any one time be rendered perfectly consistent *inter se*, by reference to one observer's result, yet they cannot be strictly comparable with the observations of other observatories, or those of the same observatory at distant periods of time, because the one same observer would not be present to give the assumed standard. It might be of considerable importance, therefore, to establish a mechanical criterion of the accuracy of time observations which could be appealed to at any observatory, and at any future time. I have not been able to learn that such an experiment has hitherto been tried.

J.

The Fertilisation of Winter-flowering Plants

WILL you permit me to add a few words to Mr. Bennett's letter, published at p. 58 of your last number? I did not cover up the *Lamium* with a bell-glass, but with what is called by ladies, "net." During the last twenty years I have followed this plan, and have fertilised thousands of flowers thus covered up, but have never perceived that their fertility was in the least injured. I make this statement in case anyone should be induced to use a bell-glass, which I believe to be injurious from the moisture of the contained air. Nevertheless, I have occasionally placed flowers, which grew high up, within small wide-mouthed bottles, and have obtained good seed from them. With respect to the *Vinca*, I suppose that Mr. Bennett intended to express that pollen had actually fallen, without the aid of insects, on the stigmatic surface, and had emitted tubes. As far as the mere opening of the anthers in the bud is concerned, I feel convinced from repeated observations that this is a most fallacious indication of self-fertilisation. As Mr. Bennett asks about the fertilisation of Grasses, I may add that Signor Delpino, of Florence, will soon publish some novel and very curious observations on this subject, of which he has given me an account in a letter, and which I am glad to say are far from being opposed to the very general law that distinct individual plants must be occasionally crossed.

CHARLES DARWIN

Down, Beckenham, Kent, Nov. 13

Elimination of Alcohol

ALLOW me to remark on a statement made in one of the chemical notes of last week's NATURE.

A new test for alcohol discovered by M. Lieben is there described, and its alleged value in solving an important physiological problem is dwelt upon. Now the real course of events has been as follows:—Since the year 1860, when MM. Lallemand, Duroy, and Perrin published their researches on alcohol and anaesthetics, the old belief in the combustion of alcohol within the organism has been almost entirely upset; and it was supposed that this substance was entirely eliminated without change. Dr. Anstie was, I believe, the first who publicly criticised the conclusions of these physiologists, and showed, by a number of experiments, that a small proportion only of the alcohol introduced is excreted by the kidneys. [See Dr. Anstie, "Stimulants and Narcotics," Macmillan, 1864; also further researches recorded in his Lectures on Acute Diseases at the College of Physicians, *Lancet*, 1867, vol. ii.]

The question was next taken up by Dr. Thudichum, who estimated the amount of alcohol excreted by a number of men after they had taken a considerable quantity of wine, and proved it to be only one-half per cent. of the total amount swallowed. Finally, the writer of this, during 1866 and 1867, made numerous experiments in the same direction. In these, not only was it shown that alcohol can be detected in the urine secreted during

several hours after the dose had been taken, but it was also quantitatively proved that the total proportion eliminated was an excessively small fraction of what was taken into the body. This was demonstrated both in the case of healthy men, and in that of persons suffering from disease. [See Tenth Report of the Medical Officer of the Privy Council, p. 288.]

Moreover, unknown to either of the above observers, M. Schulinus of Dorpat, in 1866, made elaborate experiments on animals, which also showed conclusively (1) that elimination of alcohol does take place, and (2) that it only represents a fractional part of the alcohol taken. [Archiv. f. Heilkunde, 1866.]

However delicate and useful, therefore, M. Lieben's test may be in itself, it was not needed to decide this question, which was already settled. A. DUPRÉ, Ph.D.

Laboratory, Westminster Hospital, Nov. 15

NOTES

THE Royal Society commences another session to-night. The communication of the results of the recent dredging expedition in the *Porcupine* will most probably take up the whole of the evening.

THE great "Catalogue of Scientific Papers compiled and published by the Royal Society," has now reached its third volume; a fact which we have much pleasure in announcing. In this the names of authors are carried on from GRE to LEZ inclusive, so that the compilers are nearly half-way through the alphabet. We congratulate them on their good progress, and can promise them the cordial appreciation of scientific men all over the world, to whom the work will prove of inestimable value. Does a mathematician wish to know how many mathematical papers have been written by Grunert, the well-known editor of the "Archiv," he turns to this volume, and finds 343. Guérin Méneville, the naturalist, figures for 326; Hagen, entomologist, for 102; the veteran Haidinger has 286 on minerals and meteorites; while Henwood, a Cornish celebrity, shows 55 papers on geological and mining subjects; and Heer, of Zurich, to whom we are indebted for admirable descriptions of fossil flora of the primeval world, numbers 46; Sir William Hamilton heads a list of 69 papers; Hansen, 103, probing deep into astronomy; Hansteen, the Norwegian, who lives to see in Sir Edward Sabine's researches, a grand outcome of his own early investigations of terrestrial magnetism, has 141 papers; Dr. Hooker appears for 58 papers; his late father for 72; and the late W. Hopkins, who did so much in mathematical geology, for 33. Dr. Hofmann, the eminent chemist, has made himself responsible for 156 papers; Mr. Lassell for 66, and Leverrier for 88. Kummer, recently elected a foreign member of the Royal Society, is down for 51; Leuckhart for 64; the indefatigable Isaac Lea, of Philadelphia, for 106, mostly about shells; and Lamont, of Munich, for 90, on magnetism, meteorology, and various questions in physical astronomy. From this brief selection our readers will see what a rich fund of scientific information has been prepared for their use by the Royal Society.

AMONG the recently published state papers of the American Government, is the annual report of the president of the National Academy of Sciences, from which we make the following extracts. It will be seen that in America there is no mistake about what is considered to be the duty of the Government in regard to scientific research—we wish we could say as much for England:—"The members of the Academy consist principally of professors in our colleges, and a few officers of the army and navy, who, from their social position and moral character generally, have the confidence of the public in a degree surpassed by no other class of the community. They are, however, generally men of limited means, receiving no pecuniary reward for their discoveries, and by law allowed nothing for their labours in the Academy, and who

can ill afford the expense of assembling, from a distance, in the city of Washington. A small sum appropriated by Congress for the expense of their annual meetings, by which a full attendance could be secured, would be money well bestowed. It would stimulate higher researches, elevate the character of the association, and be productive of more valuable assistance to the Government. I feel myself more at liberty to urge the claims of the Academy, inasmuch as its members generally, including myself, took no step towards its establishment. Indeed, I must confess that I had no idea that the national legislature, amid the absorbing and responsible duties connected with an intestine war, which threatened the very existence of the Union, would pause in its deliberations to consider such a proposition. But Congress, having expressed its sense of the importance of an organisation of this kind, the members designated accepted in good faith the appointment, and have since endeavoured zealously to discharge the obligations thus devolved upon them. *It is now the duty of Congress to do its part, by furnishing the means to enable the Academy to fulfil its mission with credit to itself and the nation.*"

THE Minister of Public Instruction has given orders for the construction of an Agricultural Map of France, on a novel plan. It will be built up of specimens of the various soils, arranged according to locality.

FROM accounts of the last meetings of the Wellington Philosophical Society and New Zealand Institute which have reached us, it is clear that good scientific work is being done at our antipodes, much of it in Dr. Hector's laboratory. The most interesting result recently obtained is the isolation of the poisonous substance in the Tutu plant. Many experiments made for this purpose during the last six years, both in the laboratory of the Geological Survey and by chemists in Great Britain, failed to discover the poisonous ingredient of the plant. A short time ago, Mr. Henry Travers collected for the Museum a large quantity of ripe seeds of the Tutu (*Coriaria ruscifolia*), and on these Mr. Skey has recently experimented. He has discovered the poison to be a greenish oil, unaffected by, and insoluble in, water and mineral acids, but soluble in acetic acid, ether, alcohol, and chloroform. This oil is combined with a red-coloured resin, which is insoluble in ether, by removing which the poisonous oil was obtained in a pure state. The quantity of the poison contained in the seed is 12 per cent. of the weight. A similar oil has been detected by Mr. Skey to be the active poisonous element in the Karaka seed (*Corynocarpus leirigata*), which will account for its having hitherto escaped detection; and he suggests that the discovery might lead to the detection of the active principle of many poisonous European plants that have hitherto eluded research.

ANOTHER item of New Zealand news is that the result of all Dr. Hector's investigations into the geology of the islands is, that New Zealand must be considered as, on the whole, well supplied with mineral fuel. The most valuable description of coal is certainly confined to limited and not very accessible areas; but still there is nothing to prevent their being profitably worked for the supply of the steam service. The great point for congratulation, however, is, that throughout almost every part of the islands, coal of a practically useful description is to be found within a short distance.

WE are glad to see that the Essex Institute—not our Essex, but the American one—is extending its sphere of action by issuing a Bulletin in addition to their ordinary proceedings. The Bulletin is intended to give to the public such portions of communications made to the Institute at its semi-monthly and other public meetings, as are of popular interest. A brief summary of all the proceedings at each meeting will be given, which will